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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,995	02/21/2002	Mindaugas F. Dautartas	23091/16 (ACT-179)	1731
26086	7590	09/23/2004	EXAMINER	
HALEOS, INC. 3150 STATE STREET BLACKSBURG, VA 24060			WOOD, KEVIN S	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

K8

**Office Action Summary**

Application No.

10/081,995

Applicant(s)

DAUTARTAS, MINDAUGAS F.

Examiner

Kevin S Wood

Art Unit

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11 and 22 is/are allowed.
- 6) ☐ Claim(s) 1,2,4-10 and 14-21 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/28/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **FINAL REJECTION**

### ***Response to Amendment***

1. This Office Action is responsive to the Applicant's Amendment filed 28 June 2004. Claims 1 and 10 are amended. No new claims have been added. Claims 11 and 22 have been previously cited as allowable by the examiner. Claims 1-11 and 14-22 are pending in the application.

### ***Response to Arguments***

2. Applicant's arguments filed on 28 June 2004, with respect to claims 1-11 and 14-22 have been fully considered but they are not persuasive.

Referring to claim 1, 2, and 4-9, the Applicant's primary argument is that U.S. Patent No. 6,015,976 to Hatakeyama et al. reference does not disclose the optical waveguide having an optical axis that is non-parallel to the etching direction, where the thickness of the waveguide varies along the optical axis. The examiner respectfully disagrees with this argument. Hatakeyama et al. discloses a method of manufacturing an optical device including: moving a mask (M) situated between a layer of optical waveguide material (W) to be shaped and a source of etchant ions (212), wherein at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions, thereby causing vertical thickness variations between the at least two areas. See Fig. 80 through Fig. 121, along with their respective portions of the specification. Ion beam etching is specifically disclosed in col. 21, line 57 through col.

23, line 2. The applicant appears to be interpreting the term "optical axis" as having some special narrow definition, which has not been disclosed in the specification. It is clear from the figures of the reference that the waveguide disclosed by Hatakeyama et al. has an optical axis that is perpendicular to the direction of the movement of the mask during etching.

Referring to claim 10, the Applicant's primary argument is that Hatakeyama et al. reference does not disclose the reciprocating motion is in a direction that is perpendicular to the direction of the teeth within the mask. The examiner respectfully disagrees with this argument. In Fig. 100 and Fig. 102, Hatakeyama et al. clearly disclose the teeth of the mask being aligned in a direction that is perpendicular to the movement of the mask.

Referring to claims 14-21, the Applicant's primary argument is that Hatakeyama et al. reference does not disclose a waveguide, instead the Hatakeyama et al. reference is disclosing workpieces. The applicant goes on to argue that workpieces are not synonymous with waveguides. The examiner agrees that the term workpiece is not inherently synonymous with the term waveguides within the optical art. Hatakeyama et al. did not limit their method to only producing optical waveguides, however, the reference clearly discloses that the workpieces formed by these methods may be optical waveguides. Therefore it is reasonable to consider the terms to be synonymous within the Hatakeyama et al. reference.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4-10, 14-16 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,015,976 to Hatakeyama et al.

Referring to claim 1, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a method of manufacturing an optical device including: moving a mask (M) situated between a layer of optical waveguide material (W) to be shaped and a source of etchant ions (212), wherein at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions, thereby causing vertical thickness variations between the at least two areas. See Fig. 80 through Fig. 121, along with their respective portions of the specification. Ion beam etching is specifically disclosed in col. 21, line 57 through col. 23, line 2.

Referring to claim 2, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a mask (M) having a comb shape comprising teeth. See Fig. 98 and Fig. 100.

Referring to claim 4, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a mask (M) having at least one slit. See Fig. 98 and Fig. 100.

Referring to claim 5, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a mask (M) that may be stationary.

Referring to claims 6, 14 and 21, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a vertically tapered waveguide produced by the method. See the Figures of the reference. Many of the workpieces (W) are vertically tapered.

Referring to claim 7, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses a diffraction grating produced by the method. See Fig. 102 and Fig. 103, along with their respective portions of the specification.

Referring to claim 8, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses the mask (M) moving in a linear direction with respect to the plane of the optical waveguide direction. See Fig. 100, Fig. 102 and Fig. 107.

Referring to claims 9 and 10, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses the mask (M) reciprocating with respect to the plane of the optical waveguide direction. See Fig. 104 through 106, along with their respective portions of the specification.

Referring to claim 15, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses the waveguide material (W) may be silicon. See col. 22, lines 52 through col. 23, line 2.

Referring to claim 16, Hatakeyama et al. discloses all the limitations of the claimed invention. Hatakeyama et al. discloses that the beam source provide fast atomic beams, ion beams, electron beams, laser beams, radiation beams, X-ray beams, or radical particle beams. See col. 21, line 67 through col. 22, line 2.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,015,976 to Hatakeyama et al.

Referring to claim 17, Hatakeyama et al. discloses all the limitations of the claimed invention, except Hatakeyama et al. does not appear to disclose that the mask is in contact with the waveguide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the mask in contact with the waveguide, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. Placing the mask on the waveguide, is minimizing the separation



between the two components, and would clearly fall into the realm of finding an optimum or workable range for the distance between the two components. In re Aller, 105 USPQ 233.

Referring to claim 18, Hatakeyama et al. discloses all the limitations of the claimed invention, except Hatakeyama et al. does not appear to disclose that the mask is up to 250 microns above the waveguide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the mask up to 250 microns above the waveguide, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Referring to claim 19, Hatakeyama et al. discloses all the limitations of the claimed invention, except Hatakeyama et al. does not appear to disclose that the mask is moved a distance of 50-100 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to move the mask a distance of 50-100 microns, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Referring to claim 20, Hatakeyama et al. discloses all the limitations of the claimed invention, except Hatakeyama et al. does not appear to disclose that depth of the taper is in the range of 0-5 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the depth of the taper 0-5 microns, since it has been held that where the general conditions of a claim



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are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

### ***Allowable Subject Matter***

7. Claims 11 and 22 are allowable.
8. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin S Wood whose telephone number is (571) 272-2364. The examiner can normally be reached on Monday-Thursday (7am - 5:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KSW

  
AKM ENAYET ULLAH  
PRIMARY EXAMINER